Remarks:

These remarks are responsive to the Office action dated March 24, 2008. Prior to entry of this response, claims 1-50 were pending in the application. By way of this response, claims 1, 7, 9, 10, 26, 34, and 48 are amended and claim 6 is cancelled without prejudice. Applicant respectfully requests reconsideration of the application and allowance of the pending claims.

The Examiner's request under 37 CFR 1.105

In response to the Examiner's request under 37 CFR 1.105, Applicant has conducted an extensive search of Applicant's computer archive. Applicant believes the search is exhaustive. The single document Applicant has located to comply with the Examiner's request is entitled PathTracker™ Bulletin: Aisle BuySpeed™, and is included with this response.

Formal Matters

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5). The Examiner notes that reference device 12 is included in paragraph [0032] but is not in Figure 4. Applicant believes the Examiner intended to identify paragraph [0033], and not paragraph [0032]. Applicant has amended paragraph [0033] to clarify the relationship between paragraph [0033] and Figure 3. Applicant respectfully requests the Examiner withdraw the rejection.

The Examiner notes that reference device 36 is included in paragraph [0039] but is not in Figure 4. Applicant believes the Examiner intended to identify paragraph [0040], and not paragraph [0039]. Applicant has amended paragraph [0040] to clarify the relationship between paragraph [0040] and Figure 4. Applicant respectfully requests the Examiner withdraw the rejection.

Claims 48-49 are objected to because of a typographical error. Applicant has amended claim 48 to fix the typographical error. Claim 49 depends from claim 48 and is

therefore also corrected. Applicant respectfully requests the Examiner withdraw the rejection.

Rejections under 35 U.S.C. § 112

Claims 1-40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Specifically the Examiner states, "There is insufficient antecedent basis for "normalized shopper data" in claim 1. Applicant has amended claim 1 to recite "normalized path data". Support is found earlier in claim 1. Applicant respectfully requests the Examiner withdraw the rejection.

Claims 1-50 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Specifically, the Examiner states, "it is unclear what normalized data the applicant is referring to in [claim 26]". Applicant has amended claim 26 to recite "normalized product purchase data". Support for this recitation can be found at least in paragraph [0060]. Applicant respectfully requests the Examiner withdraw the rejection.

Claim 34 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. The Examiner states, "It is unclear how the ellipse is used to calibrate a predetermined percentage of the shopper behavior." Applicant has made a clarifying amendment to claim 34 which is believed to overcome the rejection. Support for the amendment can be found at least in paragraph [0078]. Applicant respectfully requests the Examiner withdraw the rejection.

Rejections under 35 U.S.C. § 102

Claims 1, 17, 38, and 39 are rejected under 35 U.S.C. 102(b) as being anticipated by A Stochastic Model of Supermarket Traffic Flow, published 1966 (Farley et al.).

Claim 1 as currently amended reads as follows:

1.   (Currently amended) A method for analyzing a shopping environment, the method comprising the steps of:

tracking a plurality of paths of a plurality of persons in the shopping environment;

recording corresponding path data;

normalizing **the** path data for each path by use of a predetermined normalization function **including converting path position data from different shopping environments into a common physical frame of reference, to thereby produce normalized position data for the paths**;

calculating a predetermined statistical measure of the normalized **path**~~shopping~~ data; and

producing output based upon the predetermined statistical measure.

Claim 1 now includes the following recitation, "converting path position data from different shopping environments into a common physical frame of reference". This recitation was in claim 6 as originally filed, which is now cancelled. Therefore, Applicant will address the Examiner's rejection of claim 6.

Rejections under 35 U.S.C. § 103

Claims 2-16, 18-26, 37, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over A Stochastic Model of Supermarket Traffic Flow, published 1966 (Farley et al.) as applied above in claims 1, 17, 38, and 39 and in further view of 6,563,423 (Smith).

In rejecting claim 6 the Examiner states:

While neither Farley nor Smith expressly teaches a common physical frame of reference official notice is taken that the statistical technique of scaling (standardizing) to a common physical frame of reference, thus allowing for an apples to apples comparison was an old and well known technique used in analyzing statistical data. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the old and well known techniques of scaling (standardizing) to a common physical frame of reference in the analysis of data collected in the disclosure of Farley to allow for a higher order probability model (Farley 567).

Applicant respectfully traverses the Examiner's rejection of claim 6, effectively now the Examiner's rejection of claim 1. There is a wide gap between the teachings of Farley and Smith, whether taken alone or in combination, and Applicant's invention as claimed. Respectfully, the Examiner is taking great liberty in an attempt to close this gap, and is apparently using the rationale set forth in MPEP 2143. However, in order to use this rationale to support a conclusion that a claim is obvious, all of the following findings must be made:

> (1) a finding that the prior art contained a "base" device (method, or product) upon which the claimed invention can be seen as an "improvement;"
> (2) a finding that the prior art contained a known technique that is applicable to the base device (method, or product);
> (3) a finding that one of ordinary skill in the art would have recognized that applying the known technique would have yielded predictable results and resulted in an improved system; and
> (4) whatever additional findings based on the Graham factual inquiries may be necessary, in view of the facts of the case under consideration, to explain a conclusion of obviousness.

Applicant respectfully submits that at least finding (3) above is not satisfied by the Office action. Rather, for the reasons discussed in detail below, Applicant submits that one of ordinary skill in the art would have no reasonable expectation of predictable results that would result in an improved system, from the application of the alleged prior technique of standardizing to a common physical frame of reference to the teachings of Farley and Smith.

Shopper researchers have always considered location in a store to be defined by what products are present there. For example, a location would be defined as being in or near where the dairy items are displayed, or in the peanut butter aisle. To normalize a store in a way which does not consider where any products are, and to predict that one would find a useful result out of such technique would not occur to one of ordinary skill in the art.

The product-centric focus of the prior art is very obvious when reading Farley. In fact, Farley's whole premise is that <u>products pull people</u> through a store much like a mass gravitationally pulls on another mass. Farley <u>teaches away</u> from analyzing shopper

behavior in any way other than by first considering the location of a product. Without Farley's focus on products, he would have no model and no publication.

Only Applicant's invention as claimed allows a retailer a more meaningful analysis of collected tracking data, and the ability to compare data from different retail environments using a common physical reference.

With regard to Smith, the teachings are directed to an automated system to track individuals in a retail establishment. Smith provides a "location tracking system [that] utilize[s] electronically-readable tags formed of magnetic composition [that are] applied to individuals' footwear, with the magnetic composition encoded with a unique code for each individual. Through the sensing of the tags with magnetic sensors disposed at one or more sensor locations, specific individuals may often be tracked in a reliable, unobtrusive and cost effective manner" (column 3, lines 33-41).

Smith illustrates this "product-centric" focus in the art in his background section (column 1, lines 20-28). Smith states:

> "As an example, grocery stores have for many years put staple items such as milk and bread in the rear part of a store so that customers will need to walk through much of the store to get those items, and hopefully find other items for purchase on the way. Similarly, grocery stores often organize product displays to locate complimentary items (e.g., ice cream and ice cream cones) close to one another so that customers are encouraged to purchase those complimentary items."

Smith provides very little teaching regarding what to do with the tracking data collected. Smith's focus is not on data analysis. Instead, for the most part, Smith's teaching is focused on an apparatus and technique to spray magnetic ink onto the bottoms of shoppers' footwear and then to use sensors to track the shoppers' movement within a retail environment. What little teaching Smith does provide about what to do with the data collected begins in column 12, at line 13 under the heading "Customer Location Data Analysis and Utilization"

The three paragraphs of this section include the following two passages (the first at lines 23-28, and the second at lines 46-48):

"by placing sensor arrays proximate cash register locations, records of purchases may be associated with customers to provide further information such as a determination of whether a customer that visited a certain location ultimately purchased a product from that location."

"Client 184 may include a customer location correlation engine that analyzes the correlation between customer location and sales."

This section, and in particular these two passages, makes clear that Smith considers location in a retail environment to be defined by what products are there.

In fact, even the Examiner illustrates this product-centric view of store locations in the Office action. The Examiner states in the Office action, on bottom of the page 19:

"Further it is noted that it is also old and well known in the art that stores are divide[d] in to multipl[e] departments such as checkout, perishables, frozen, etc."

The Examiner's comment shows an understanding similar to Farley and Smith, and is based on product location, rather than spatial location. The method of amended claim 1, in contrast, can be used to compare shopper position from various stores, irrespective of product position. In fact, a shopper in the meat department in one store may occupy the same normalized spatial position that a shopper in the frozen food department occupies in another store. There is no indication in any of the references of this approach, nor of any value that such an approach would bring. Applicant submits that normalizing a path data from multiple stores to produce path data that is spatially normalized irrespective of product-defined departments, as only Applicant has, is a novel idea that would not be expected by one of ordinary skill in the art to yield predictable results that result in an improved system. Only Applicant's disclosure shows the results to be an improved system, and only in hindsight would one of ordinary skill in the art see that the spatial normalization as taught by Applicant would yield an improved system.

Therefore, this rationale does not support the Examiner's conclusion. Further, none of the other rationales as set forth in MPEP 2143, nor any other grounds, can be found to support a conclusion of obviousness.

Accordingly, claim 1 as currently amended is not obvious. Applicant respectfully requests that the Examiner reconsider the conclusions set forth in the Office action in view of the amendments and remarks made herein, and allow claim 1.

Application No. 10/667,213
Application Filing Date: September 19, 2003
Docket No. SNS307

In view of the above, Applicant respectfully requests that the rejection under 35 U.S.C. 103(a) based on the combination of Farley et al. and Smith of independent claim 1, as well as dependent claims 2-26 and 37-40, be withdrawn.

Claims 27-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over A Stochastic Model of Supermarket Traffic Flow, published 1966 (Farley et al.) and U.S. Patent No. 6,563,423 (Smith) as applied above in claim 2 and further in view of Tracking Shoppers Through the Combination Store, published 1988 (Heller).

Claims 27-36 depend directly or indirectly from, and include all the recitations of, base claim 1 which is in condition for allowance as discussed. Accordingly, claims 27-36 are also in condition for allowance. Therefore, allowance is respectfully requested.

Claims 41-45 and 48-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over 6,563,423 (Smith).

Independent claim 41 reads as follows:

> 41. (Original) A system for use in analyzing a shopping environment, the system comprising:
> a computing device configured to receive path data corresponding to a plurality of persons tracked in one or more shopping environments, the path data including position data and time data, and execute an analysis program having a normalization module and a statistical calculation module;
> wherein the normalization module is configured to convert the path data to a common time frame of reference and a common physical frame of reference, to thereby produce normalized path data; and
> wherein the statistical calculation module is configured to calculate a predetermined statistical measure based on the normalized path data.

Claim 41 includes the recitation

> "wherein the normalization module is configured to convert the path data to a common time frame of reference and a common physical frame of reference, to thereby produce normalized path data"

This recitation is similar to the recitation(s) in claim 1 discussed above. For at least for the same reasons discussed above regarding why claim 1 is in condition for allowance over Farley and Smith, claim 41 is also in condition from allowance over Smith alone.

Application No. 10/667,213
Application Filing Date: September 19, 2003
Docket No. SNS307

In view of the above, Applicant respectfully requests that the rejection under 35 U.S.C. 103(a) based on Smith taken alone of independent claim 41, as well as dependant claims 42-45 and 48-50, be withdrawn.

Claims 46-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,563,423 (Smith) as applied to claim 41 above and further in view of U.S. Patent No. 5,729,697 (Schkolnick et al.).

Claims 46-47 depend directly or indirectly from, and include all the recitations of, base claim 41 which is in condition for allowance as discussed. Accordingly, claims 46-47 are also in condition for allowance. Allowance is respectfully requested.

Conclusion

Applicant believes that this application is now in condition for allowance, in view of the above amendments and remarks. Accordingly, Applicant respectfully requests that the Examiner issue a Notice of Allowability covering the pending claims. If the Examiner has any questions, or if a telephone interview would in any way advance prosecution of the application, please contact the undersigned attorney of record.

Please charge any cost incurred in the filing of this Response, along with any other costs, to Deposit Account No. 503397.

Respectfully submitted,

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Application No. 10/667,213
Application Filing Date: September 19, 2003
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PathTracker™ Bulletin: Aisle BuySpeed™

An analysis of the amount of time shoppers require to make their purchases in different aisles and categories is interesting. In interpreting the data it is important to make a distinction between physical locations (aisle, aisle-part) and the merchandise displayed there (category). For example, if shoppers are taking a long time to make a purchase, is this because of the physical location, or is the product one that requires a lot of thought and consideration? For example, consider the Aisle BuySpeed™:

Aisle BuySpeed
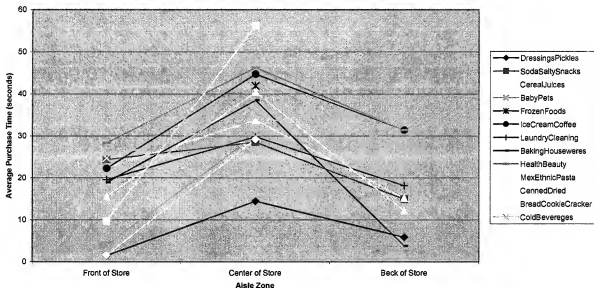
Bear in mind that this data has about 15% of the subzones removed as "outliers," that is, they are statistically far from this "normal" data. We will look at *each* of these outliers shortly, as the reasons for their deviations from norms can be instructive.

The chart shows certain strong trends:

- For any given aisle, the fastest shopping tends to occur in the subzone immediately adjacent to the front endcap. Since this pattern repeats from aisle to aisle, it is unlikely to be driven by any specific merchandise. It is most likely driven by the strong magnet effect of the checkout lanes: when shoppers are near the checkout, their minds turn to exiting the store to go home, not to careful deliberation on products for purchase. This is also consistent with the known flow of traffic from the back of the store to the front. The subzone at the front of the store will typically be the last one visited in that aisle.
- Shopping in the center of the store is a slow process. Again, since the pattern is repeated across many aisles, it is unlikely to be merchandise driven. It is more likely to be driven by the inherent difficulty of finding what you want on a large wall of densely packed items displayed *beside* you (as you pass) rather than in front of you. It is also possibly driven by the lack of traffic in these places, which facilitates more leisure in shopping and selection of products.
- Shopping in the subzone immediately adjacent to the rear endcap is substantially faster than in the center of the store, but not as fast as at the front of the store. This is particularly significant because that is the subzone with the highest traffic in the aisle.

- Although the pattern of faster shopping at the ends and slower shopping in the middle of the aisles is consistent across aisles and categories, the absolute amount of time varies widely. For example, in the "CannedDried" aisle, shopping times zoom from 10 seconds for beans, chili and pasta to 56 seconds a few feet down the aisle at the dinner mix and instant potato sections. The averages across all aisles are 16 seconds for the subzone contiguous to the frontend cap, 36 seconds for the interior subzones and 18 seconds for the subzones near the rear endcaps.

The exceptions to these general trends, the outliers, are interesting and tend to confirm the rules outlined above. ("The exceptions prove the rule.") The 15% of outliers (10 subzones) include the following examples:

- Salad dressings, both pourables and spoonables, are very fast purchases, even though they are in the middle of the aisle. However, this is not an ordinary aisle since it is wide enough to accommodate large island displays (such as pallets of soft drinks), and is a "double aisle" in the sense that cold beverages are on the opposite side of the large aisle. The width of the aisle may be significant because shoppers may approach the dressings face-on from some 20 feet away, even though they are in a central subzone. Whether this contributes to the rapid purchase, or the rapid purchase is inherent to the category will soon be known since the entire section was recently reset to the next narrow aisle over, trading places with the higher volume salty snacks. (There were no anomalies in BuySpeed™ on the cold beverage wall.)
- The penultimate display on the rear of the salty snack aisle had a BuySpeed™ of 3 seconds. But since this is a salty snack section adjacent to the end salty snack section with a BuySpeed™ of 15 seconds, it is perhaps not surprising.
- The rear-most section in the BabyPets aisle has an average BuySpeed™ of 54 seconds, well above any possible norm for that area. But this seems understandable given the plethora of varieties in very small jars, coupled with the emotionally charged importance of selecting food for the baby.
- The main frozen food aisle exhibits a nearly uniform BuySpeed™, with a slight increase in the rear-most subzone (53 seconds.) Otherwise, the average anywhere along the aisle is 42 seconds. These times (and the normal 45 seconds for the IceCreamCoffee in the adjacent aisle) are near those for baby food, Mexican sauces and canned soup. Purchases of frozen foods require a lot of time, and this is facilitated by the extra wide aisles provided (necessary to accommodate opening doors.) The wideness of the aisles may be encouraging more leisurely shopping, too.
- Two of the HealthBeauty central subzones have abnormally low BuySpeeds™ of 5 seconds. One of these subzones contains toilet paper, a frequent purchase for which a low BuySpeed™ makes sense. Other items such as oral care, deodorant, feminine care, vitamins, etc., make less sense in terms of rapid purchases. This anomalous situation may be clarified by other observations or further study.
- At the back of the EthnicPasta aisle Mexican sauces and tomato products are requiring 46 seconds to buy. Both of these types of products have a wide variety of forms, flavors and strengths. Possibly this provides sufficient confusion or options to hold shoppers for the extended period.
- In the back of the CannedDried aisle there is the very slow BuySpeed™ (56 seconds) associated with the canned soup, and the adjacent fast BuySpeed™ of 6 seconds for canned fruit. The soup section is heavily shopped, with many varieties and optional forms to choose from. The potential for confusion has to be similar to that for the baby food, without the emotional complication.

This is the extent of the outliers, with only one or two examples having inexplicable results. This suggests that within limits, the lineal placement of categories on aisles can be done according to rational principles supported by hard data on shopper paths, densities and buying behavior.